

REMARKS

Claims 1-35 are pending in the Application. Claims 1-20 and 31-33 are canceled by the present Amendment. Claim 21 has been amended to correct typographical errors. All of remaining claims 21-30 and 34-35 stand rejected by the pending Office Action.

I. EXAMINER INTERVIEW

On October 24, 2005, the undersigned had a telephone interview with Examiner Pam Rodriguez (Examiner) regarding the Office Action issued July 15, 2005. The Applicant appreciates the courtesy and assistance extended by the Examiner during this interview. The discussion focused on claim 21 and the Examiner's rejection of that claim using the Murty and Arsem references. (See section III(C).) The undersigned pointed out that (1) claim 21 claims a magnetorheological damper and neither Murty nor Arsem discloses magnetorheological dampers, and (2) magnetorheological dampers cannot be used to replace the dampers in Murty because the Murty dampers are also generators and thus magnetorheological dampers would have to be additional components to the Murty system rather than replacing the dampers disclosed in Murty. The undersigned pointed out that the Catanzarite reference is the only reference cited in the Office Action that discloses the use of a magnetorheological damper and Catanzarite, however, does not disclose any form of self-powering system.

The Examiner agreed with the undersigned that neither Murty nor Arsem disclose magnetorheological dampers, that there has not been shown any motivation to combine Murty and Arsem or Murty with Catanzarite, that Catanzarite is a totally different system and does not appear to be compatible with the system of Murty, and that claim 21 appears to be allowable over the prior art referenced in the July 15, 2005 Office Action.

The undersigned also pointed out and the Examiner agreed that "semi-active damper" is a term of art which refers to dampers having damping properties that can be

changed but which never apply an active damping force. The term “semi-active damper” thus does not refer to systems that are active some of the time and passive some of the time as suggested by the Examiner at paragraph 11 of the Office Action of November 5, 2003.

II. NON-STATUTORY DOUBLE PATENTING REJECTION

The Applicant thanks the Examiner for withdrawing the double patenting rejections in view of the terminal disclaimer filed May 3, 2005.

III. THE CLAIMS ARE PATENTABLE OVER THE PRIOR ART

A. Paragraph 13 Rejection of Claims 1, 11, 29, 34, and 35

In paragraph 13 of the Office Action, claims 1, 11, 29, 34, and 35 were rejected under 35 U.S.C. 102(b) as assertedly anticipated by Murty et al., U.S. Patent No. 5,091,679 (Murty Patent). Claims 1 and 11 have been canceled thereby rendering their rejection moot. The Applicant respectfully traverses this rejection with respect to claims 29, 34 and 35.

1. Claims 29, 34, and 35

Claim 29 recites a self-powered semi-active damping system comprising a semi-active damper disposable intermediate a load and a base wall. The semi-active damper being adapted for providing a selectively variable reaction force to the load and the base wall responsive to a relative displacement of the load with respect to the base wall. The system also comprises a damper controller operatively connected to the semi-active damper for controlling the reaction force applied to the load and the base wall, a rechargeable power supply operably connected to the damper controller and the semi-active damper, and a recharging arrangement in electrical communication with the rechargeable power supply. The recharging arrangement includes a piezoelectric generator and is mountable to one of the base wall and the load and is adapted for converting vibratory motion to electrical energy for storage in the rechargeable power

supply. Claim 29 has been amended to recite a piezoelectric generator as part of the recharging arrangement.

Claim 34 is dependent on claim 29 and further recites that the system comprises a rechargeable power supply which includes a battery and at least one capacitor and is connected to the recharging arrangement through a rectifier bridge circuit.

Claim 35 is dependent on claim 29 and further recites that the system comprises a rechargeable power supply which includes a plurality of ultracapacitors connected to the recharging arrangement through a rectifier bridge circuit.

2. The Features of Claims 29, 34, and 35 Are Not Disclosed By the Murty Patent

The Murty Patent was discussed in detail in the previous Response dated May 2, 2005.

The Applicant respectfully submits that the Murty Patent does not disclose the features of any of independent claims 29, 34, and 35. In particular, the Murty patent does not disclose a system comprising a semi-active damper. As is well-known in the art, the term “semi-active” is applied to a damping mechanism that supplies a controllable, variable degree of damping. Magnetorheological and electrorheological dampers are examples of semi-active dampers in which the degree of damping may be controlled through the application of electrical power to the fluid in the damper.

In contrast, the Murty Patent discloses an active damping system having actuators that may be used in an active control mode that uses electric power or in an essentially passive damping mode that generates electric power. Throughout the Murty Patent, it is emphasized that the actuators (“dynamoelectric machines”) are used to provide active control. In other words, these actuators generate and apply a countering force to the load rather than merely acting as a variable resistance. As discussed in the Interview Summary, there is no suggestion in the Murty Patent that the actuators be used in a semi-active mode in which they exhibit controllable, variable damping.

Further, the Murty Patent does not disclose a separate charging mechanism apart from the actuators (dynamoelectric machines) themselves. When the damping mechanisms of the actuators are not being used in their active mode, they are used to

generate power, which may be stored in a capacitor for later use during the active mode. Each of the systems of claims 29, 34, and 35 recite a recharging arrangement (recharging means) that is a separate element from the semi-active damping means. There is no disclosure of such a separate arrangement in the Murty Patent. In the invention disclosed by the Murty Patent, the power cannot be generated at the same time that power is being consumed by the system, while the invention disclosed in the Applicant's Application does not have such a limitation.

Still further, the Murty Patent does not disclose a piezoelectric generator as part of the recharging arrangement. Claim 29 has been amended to recite a piezoelectric generator as part of the recharging arrangement.

For at least these reasons, the Applicant respectfully submits that the Murty Patent does not anticipate either independent claim 29 or dependent claims 34 and 35. The Applicant therefore requests that the rejection of these claims under 35 U.S.C. 102(b) be withdrawn.

B. Paragraph 15 Rejection of Claims 1-5, 11-15, 29 and 30

In paragraph 15 of the Office Action, claims 1-5, 11-15, 29 and 30 were rejected under 35 U.S.C. 103(a) as being assertedly unpatentable over Catanzarite, U.S. Patent No. 5,652,704 (Catanzarite Patent) in view of the Murty Patent. Claims 1-5 and 11-15 have been canceled thereby rendering their rejection moot. The Applicant respectfully traverses this rejection with respect to claims 29 and 30.

The Murty and Catanzarite Patents were discussed in detail in the previous Response dated May 2, 2005. The Applicant respectfully submits that the features of claim 29 (described above in Section III(A)(1)) are not taught, disclosed or suggested in the combined teachings of the Catanzarite and Murty Patents.

As noted by the Examiner on page 9 of the Office Action, the Catanzarite Patent does not teach, disclose or suggest all the features of claim 29. The Applicant agrees with the Examiner that, at the least, the Catanzarite patent fails to disclose a shock and vibration isolation system having a recharging arrangement mounted to one of the base plate and the load plate and being adapted for converting vibratory motion to electrical

energy for storage in a rechargeable power supply. Further, the Catanzarite Patent does not disclose the use of a piezoelectric generator.

The Applicant respectfully submits that the Murty Patent does not cure the deficiencies of the Catanzarite Patent with respect to a recharging arrangement. For example, the Murty Patent does not disclose an piezoelectric generator as recited in amended claim 29.

Moreover, there would not be any motivation for one of ordinary skill in the art to look to the Murty Patent for a recharging arrangement for use in conjunction with the Catanzarite damping system. This is because (A) the Murty Patent does not relate to or disclose the use of a semi-active damping system and (B) the active/passive actuators of the Murty Patent could not be substituted for the semi-active damper elements of the Catanzarite system.

In the Examiner Interview, the Examiner agreed that a person having ordinary skill in the art would not be motivated to look to Murty to modify the Catanzarite system.

For at least the above reasons, the Applicant respectfully submits that the claim 29 is patentable over the combined teachings of the Catanzarite and Murty Patents. The Applicant therefore requests that the rejection of claim 29 under 35 U.S.C. 103(a) be withdrawn.

Claim 30 is dependent on 29, which have been shown to be patentable over the cited combination of the Catanzarite and Murty Patents. The Applicant respectfully submits that, because it includes all the features of the claim upon which it depends, claim 30 is also patentable over the combined teachings of the Catanzarite and Murty Patents. The Applicant therefore requests that the rejection of claim 30 under 35 U.S.C. 103(a) be withdrawn.

C. Paragraph 16 Rejection of Claims 7, 17, 21 and 32

In paragraph 16 of the Office Action, claims 7, 17, 21 and 32 were rejected under 35 U.S.C. 103(a) as being assertedly unpatentable over the Murty Patent in view of U.S. Patent No. 3,559,027 (Arsem Patent). Claims 7, 17 and 32 have been canceled thereby

rendering their rejection moot. The Applicant respectfully traverses this rejection with respect .

1. Claim 21

Independent claim 21 recites a shock and vibration isolation system for mounting equipment to a base wall. The system comprises a load plate for attachment to the equipment and a base plate for attachment to the base wall, the base plate being substantially parallel to the load plate. The system further comprises a spring arrangement intermediate the load plate and the base plate, the spring arrangement including at least one pneumatic spring engaging the load plate and the base plate to bias the load plate and the base plate in a separated relationship. A magnetorheological damper engages the load plate and the base plate and is adapted for providing a selectively variable reaction force to the load plate and the base plate responsive to a relative displacement of the load plate with respect to the base plate. A damper controller is operatively connected to the magnetorheological damper for controlling the reaction force applied to the load plate and the base plate. The damper controller includes a rechargeable power supply. The system also comprises a recharging arrangement in electrical communication with the rechargeable power supply. The recharging arrangement comprises at least one piezoelectric generator adapted for converting vibratory motion to electrical energy for storage in the rechargeable power supply.

2. The Features of Claim 21 Are Not Taught, Disclosed or Suggested in the Combination Teachings of the Murty and Arsem Patents

The Murty and Arsem Patents were discussed in detail in the previous Response dated May 2, 2005.

As has been discussed, the Murty Patent does not teach, disclose or suggest a system comprising any form of semi-active damper, let alone an MR damper. Further, the Murty Patent does not disclose a charging mechanism apart from the actuators (dynamoelectric machines) themselves. Each actuator of the Murty patent can act either

in a passive mode in which it acts as a generator or in an active damping mode. It cannot do both simultaneously.

As noted in the Office Action, the Murty Patent also does not disclose that the recharging arrangement or means for converting vibratory motion includes a piezoelectric generator.

The Arsem Patent clearly does not cure the deficiencies of the Murty Patent with respect to claim 21. As noted by the undersigned and agreed by the Examiner during the interview, neither the Murty Patent nor the Arsem Patent discloses an MR damper. Moreover, the piezoelectric generator of the Arsem Patent could not be substituted for the actuator of the Murty Patent because it clearly would not serve the dual purpose of power generation and damping as do the Murty actuators.

For at least the above reasons, the Applicant respectfully submits that claim 21 is patentable over the combined teachings of the Murty and Arsem Patents. The Applicant therefore requests that the rejection of claim 21 under 35 U.S.C. 103(a) be withdrawn.

D. Paragraph 17 Rejection of Claims 8-10, 18-20, 26-28 and 33

In paragraph 17 of the Office Action, claims 8-10, 18-20, 26-28 and 33 were rejected under 35 U.S.C. 103(a) as being assertedly unpatentable over Murty and Arsem Patents in view of U.S. Patent No. 4,080,636 (Ravizza Patent). Claims 8-10, 18-20 and 33 have been canceled, thereby rendering their rejection moot. The Applicant respectfully traverses this rejection with respect to claims 26-28.

Claims 26-28 are each dependent on claim 21 which has been shown to be patentable over the cited combination of the Murty and Arsem Patents. The Applicants submit that the deficiencies of the Murty and Arsem Patents with respect to claim 21 are not cured by the Ravizza Patent. In the Office Action, the Examiner relied upon Ravizza merely for Ravizza's teaching of a piezoelectric generator formed as a laminate of crystals having an upper surface and a lower surface used in a damping isolation system. July 15, 2005 Office Action, p. 14. There is no discussion of semi-active damping systems in the Ravizza Patent.

For at least the above reasons, the Applicant respectfully submits that the claims 26-28 are patentable over the combined teachings of the Murty, Arsem and Ravizza Patents. The Applicant therefore requests that the rejection of claims 26-28 under 35 U.S.C. 103(a) be withdrawn.

E. Paragraph 18 Rejection of Claims 22-24

In paragraph 18 of the Office Action, claims 22-24 were rejected under 35 U.S.C. 103(a) as being assertedly unpatentable over the Murty, Arsem and Catanzarite Patents. The Applicant respectfully traverses this rejection.

Claims 22-24 depend upon claim 21, which has been shown to be patentable over the cited combination of the Murty and Arsem Patents. In Particular, the Murty and Arsem Patents do not disclose the use of an MR damper in a semi-active damping system.

The Catanzarite reference does teach the use of an MR damper. However, as pointed out during the Examiner Interview and agreed by the Examiner, there is no motivation to combine these references because the piezo electric generator of the Arsem Patent could not be used in conjunction with or in place of the actuators of the Murty Patent and the actuators of the Murty Patent could not be used in place of the semi-active dampers of the Catanzarite Patent.

The Examiner agreed that there is no evidence that a person having ordinary skill in the art in examining the Murty Patent would be motivated to look to Arsem and Catanzarite to modify Murty because the systems are incompatible.

For at least the above reasons, the Applicant respectfully submits that the claims 22-24 are patentable over the combined teachings of the Murty, Arsem, and Catanzarite Patents. The Applicant therefore requests that the rejection of claims 22-24 under 35 U.S.C. 103(a) be withdrawn.

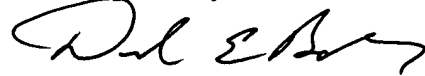
IV. CONCLUSION

For at least the above reasons, the Applicant respectfully submits that claims 21-30 and 34-35 are in condition for allowance. The Applicant therefore requests that the present application be allowed and passed to issue.

Should the Examiner believe anything further is desirable in order to place the Application in even better condition for allowance, the Examiner is invited to contact the Applicant's undersigned representative.

Date: November 14, 2005

Respectfully submitted,



David E. Baker
Attorney for Applicant
Registration No. 42,285
Telephone: (804) 788-8762
Facsimile: (804) 343-4598

Please Direct all Correspondence to:
HUNTON & WILLIAMS
Suite 1200
1900 K Street, N.W.
Washington, DC 20006